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GRAMMAR AND PRAGMATICS IN THE ACQUISITION OF
ARTICLE SYSTEMS[★]

ABSTRACT. This paper provides an analysis of articles in two unrelated languages: St'át'imcets (Lillooet Salish) and English child language. The article systems in these two languages display striking parallels, diverging in similar ways from that of English adult language. Our analysis involves a parametric difference between English and St'át'imcets. While in English adult language, article distinctions rely on the state of the common ground between speaker and hearer, in St'át'imcets they rely on speaker beliefs. Despite the similarities between the patterns of article use in St'át'imcets and child English, we propose that English-acquiring children set the parameter correctly for the English value very early, but that they initially lack a pragmatic concept requiring them to distinguish systematically between their own beliefs and the belief state of their interlocutor. This neutralizes the distinction between the two parameter values, causing the article system of English-speaking children to optionally resemble that of St'át'imcets adults. In terms of language acquisition theory, our study supports a revised version of the Strong Continuity Hypothesis, according to which children obey all principles of Universal Grammar and set parameters as soon as the relevant input is available. Any structures deviating from target language structures result from an immature pragmatic system.

1. INTRODUCTION

In this paper we examine the use of articles in two unrelated languages: St'át'imcets (a Northern Interior Salish language spoken in British Columbia, Canada, also known as 'Lillooet'), and English child language. The article systems in these two languages display striking parallels, diverging in similar ways from the article system of English adult language. An example of the divergence between English adults and children is provided in (1).

[★] For St'át'imcets data we are very grateful to Beverley Frank, Gertrude Ned, Laura Thevarg and Rose Whitley. We are also very grateful to Ariel Cohen, Henry Davis, Marcel den Dikken, Irene Heim, Nina Hyams, Tova Rappoport, Nomi Shir, and three anonymous reviewers for many helpful comments. St'át'imcets fieldwork was supported by the Social Sciences and Humanities Research Council of Canada.

- (1) Situation: picture of Mickey Mouse who just finished drawing a house.
- a. A: ... what did Mickey Mouse just do?
 B (adult): He drew **a** house.
- b. A: ... what did Mickey Mouse just do?
 B₁ (child): He drew **a** house.
 B₂ (child): He drew **the** house.

The adult uses the indefinite article *a* (as in (1a)), whereas the child can optionally choose the definite article *the*, as illustrated in (1b) by answer B2. We will show below that the system rendering the B2 choice is paralleled by the St'át'imcets system.

Our analysis of the article systems of these languages involves a parametric difference between English and St'át'imcets. Although it is tempting to attribute children's errors such as the one in (1bB2) to a parameter mis-setting (namely for the St'át'imcets value), we will argue that English two- and three-year-olds have already set the parameter correctly to the English setting. However, they fail to produce consistent adultlike outputs because they lack a pragmatic concept requiring them to distinguish systematically between their own beliefs and the belief state of their interlocutor. We will demonstrate how the lack of this pragmatic concept causes the article use of English-speaking children to optionally resemble that of St'át'imcets adults. Our account makes crucial use of the fact that English-speaking children do not merely overgenerate the definite article *the*, but they do so only in certain contexts.

We will then discuss predictions for phenomena other than article choice, and show that here St'át'imcets and English child language should diverge. In the St'át'imcets case, the lack of attention to the interlocutor's state of beliefs results from a semantic parameter related specifically to the article system. In English child language, the lack of attention to the interlocutor's state of beliefs results from the lack of a pragmatic concept which has effects in many other areas of the grammar. The predictions of our account differ from those of an alternative account whereby the English children are in the process of correcting an original parameter mis-setting for the St'át'imcets value.

Our analysis has several theoretical consequences. First, we are proposing that a category of functional elements, articles, allows cross-linguistic variation in its semantics and that this variation is best described in terms of differing parameter settings. We will show that our parametric approach has the advantage of making strong predictions about possible article systems in the world's languages.

In terms of language acquisition theory, our study supports the hypothesis that every intermediate stage of child grammar is a natural language, and therefore a coherent system, falling within the ranges of Universal Grammar (UG). This hypothesis is often referred to as the ‘Continuity Hypothesis’. Our analysis shows that differences between child and adult language can be explained by the interaction between pragmatics and grammar, rather than by different parameter settings.

The structure of the paper is as follows. We begin by defining relevant terms and concepts (section 2), and then present an overview of article choice in St’át’imcets (section 3). In section 4 we put forth our analysis of the two adult systems. In section 5 we lay out the predictions for English child language made by our analysis, and present the child language data. Section 6 contains a unified analysis of the three article systems. In section 7 we formulate predictions regarding areas of the grammar other than articles. Section 8 summarizes and concludes the paper.

2. ARTICLES AND STATES OF SPEAKER AND HEARER BELIEFS

Let us first clarify what we mean by the term ‘article’. We include in this category functional items which are correlated with argumenthood (i.e., appear on argumental phrases and plausibly function to turn predicative common noun phrases into phrases which may occupy argument positions), and are neither demonstratives nor quantifiers. We do not commit ourselves to articles occupying a particular syntactic position, although one obvious place for them is D (cf. Longobardi 1994 and others who tie the argument-creating function to the syntactic position of the head of DP).

Throughout the discussion to follow, we will need to distinguish between different states of speaker and hearer beliefs. In the remainder of this section we will define and illustrate these various states. The concepts introduced here are not new but draw heavily on previous literature.

Beliefs which are shared by all interlocutors in a discourse are said to be in the so-called COMMON GROUND of the discourse (see e.g. Stalnaker 1974, 1978; Heim 1982). As argued by Heim (1982), the definite article *the* places a requirement on the content of the common ground at the time of utterance. Speaking informally, a DP headed by *the* requires that the existence of a (unique) referent corresponding to

that DP be part of the shared beliefs between speaker and hearer at the time of utterance. If the existence of such a referent is not part of the shared beliefs between speaker and hearer, infelicity results, as illustrated in (2).

- (2) Situation: Discourse-initial utterance from one co-worker to another; no shared beliefs particular cockroaches.
A: ! I killed **the** cockroach with my bare hands this morning.

The infelicity (indicated by the exclamation mark) of A's statement in (2) is illustrated by the hearer's probable response: 'What cockroach?'^{1,2}

There are various ways for the existence of referents to become part of the common ground, two of which are illustrated in (3).

- (3) a. This is a story about a girl. **The** girl lived in a big castle.
b. **The** sun is shining today.

In (3a), the existence of a unique entity corresponding to the definite noun phrase *the girl* is part of the shared beliefs between speaker and hearer because it was established in the previous discourse, by the indefinite noun phrase *a girl*. In (3b), the existence of a unique entity corresponding to the definite nominal expression *the sun* is likewise part of the common ground, but for a different reason, namely that it is part of the long-term shared beliefs between speaker and hearer. The existence of the sun is always entailed by the common ground and it need not be explicitly introduced in prior discourse.³

Sometimes, the speaker but not the hearer believes in the existence of an entity corresponding to the noun phrase. In (4a, b), the speaker has grounds for an existential assertion about movies and cockroaches respectively, while the hearer does not. The sentences in

¹ For discussion of experiments which show that adults respond to presupposition violations as in (2) with challenges of the form 'What X?', see Conti (1999) and Matthewson et al. (2001).

² Although we do not make use of her terminology, Prince (1981, 1992) accounts for article usage in English in an intuitively similar way. In Prince's (1992) system, there is a distinction between 'Hearer-old' and 'Hearer-new' entities. The canonical correlation between definiteness and 'Hearer-old' entities accounts for the infelicity of (2) in a similar way to that sketched in the text.

³ Prince (1992) distinguishes the two cases as follows. There is a distinction between *Hearer-old* or *-new* entities and *Discourse-old* or *-new* entities. The definite in (3a) corresponds to a *Discourse-old*, and therefore also *Hearer-old*, entity, while the definite in (3b) corresponds to an entity which is *Hearer-old* but *Discourse-new*.

(4a, b) would be felicitous even if the hearer did not previously believe in the existence of movies or cockroaches.

- (4) a. I saw **a** movie last night.
b. **A** cockroach crawled out of my cereal this morning.

It is also possible for *neither* the speaker nor the hearer to have grounds for an existential assertion. Examples of this are given in (5).

- (5) a. My mother might build **a** house.
b. I haven't read **a** book for weeks.

The three possible belief states accessed by article systems are schematized in (6). 'Believed by X' is shorthand for 'X has grounds for an existential assertion'.

- (6) A believed by speaker and hearer part of common ground
B believed by speaker only not part of common ground
C believed by neither speaker nor hearer not part of common ground

The canonical realizations of the three possible belief states in the English adult article system are illustrated in (7).

(7) The English adult language article system⁴

- A believed by speaker and hearer part of common ground *the*
B believed by speaker only not part of common ground *a*
C believed by neither speaker nor hearer not part of common ground *a*

⁴ There are various well-known wrinkles with or exceptions to the simple schema in (7). For example, (ia,b) are B-contexts as we have defined them, yet allow the definite article *the*.

- (i) a. Accommodation :
Watch out, **the** dog will bite you. (from Heim 1982)
(no previous discourse, no dog in sight, no prior reason for hearer to believe that dog exists)
b. 'Bridging':
John read a book about Schubert and wrote to **the** author (from Heim 1982)

Explanations for these phenomena go beyond the purpose of this paper; see Prince (1992), Heim (1982), Hawkins (1978, 1991), Roberts (1993), among many others, for discussion.

3. ARTICLES IN ST'ÁT'IMCETS ADULT LANGUAGE

St'át'imcets articles divide semantically into two classes. The first class contains the seven articles presented in (8). These articles encode distinctions of number and of distance of the referent from the speech situation. (The 'collective plural' article is used for undifferentiated 'bunches' of objects, such as berries.) In terms of distance, there is a three-way distinction between 'present' (visible to the speaker at the time of utterance), 'absent' (at the time of utterance) and 'remote' (invisible, but may be sensed in some other way). Examples are provided in (9).⁵

- (8) St'át'imcets articles which encode number and distance distinctions

		present	absent	remote
- plural		<i>ti...a</i>	<i>ni...a</i>	<i>ku...a</i>
+ plural	-collective	<i>i...a</i>	<i>nelh...a</i>	<i>kwelh...a</i>
	+collective	<i>ki...a</i>		

- (9) a. wa7 ít'-em [ti smúlhats-a]
 IMPF sing-INTR [DET woman-DET]
 'A woman (visible to the speaker) is singing.'
- b. wa7 ít'-em [i smelhmúlhats-a]
 IMPF sing-INTR [DET.PL woman(PL)-DET]
 'Some women (visible to the speaker) are singing.'
- c. wa7 ít'-em [ku smúlhats-a]
 IMPF sing-INTR [DET woman-DET]
 'A woman (invisible to the speaker) is singing.'

The number and distance distinctions provide additional information over and above the basic semantics of this set of articles, which is to introduce wide-scope existential quantification. Examples

⁵ Abbreviations used are: APPL = applicative, CONJ = conjunctive, DEIC = deictic, DEMON = demonstrative, DET = determiner, DIMIN = diminutive, ERG = ergative, HYP = hypothetical, IMPF = imperfective, INTR = intransitive, NEG = negation, NOM = nominalizer, OOC = out of control, PL = plural, POSS = possessive, SUBJ = subject, TR = transitive.

are provided in (10), and more detailed data and analysis may be found in van Eijk (1997) and Matthewson (1998, 1999).⁶

- (10) a. *ít'-em* [**ti** *smúlhats-a*]
sing-INTR [*DET woman-DET*]
 'The/a woman sang.'
 $\exists x$ [woman (x) & sing (x)]
- b. *cw7aoz kw-s* *ít'-em* [**ti** *smúlhats-a*]
NEG DET-NOM sing-INTR [*DET woman-DET*]
 'The/a woman didn't sing.'
 $\exists x$ [woman (x) & \neg [sing (x)]]
- c. *lh* *ít'-em-as* **ti** *smúlhats-a*, *qwatsáts kelh kw-s* *Harriet*
HYP sing-INTR-3CONJ DET woman-DET leave might DET-NOM Harriet
 'If the/a woman sings, Harriet will leave.'
 $\exists x$ [woman (x) & [sing (x) \rightarrow leave (Harriet)]]

(10b, c) illustrate that the use of *ti...a* always results in a statement with existential import. For example, (10b) cannot mean 'No women sang', a statement which could be true even if no women existed. Rather, (10b) necessarily means that there is a woman, who did not sing.

The articles introduced so far contrast with two articles which necessarily do *not* introduce wide-scope existential quantification. These are *ku* and *kwelh* (with no enclitic portion).⁷ An example of the use of *ku* is provided in (11). The entire article system is presented in (12).

- (11) *cw7aoz kw-s* *ít'-em* [**ku** *smúlhats*]
NEG DET-NOM sing-INTR [*DET woman*]
 'No women sang.'
 $\neg \exists x$ [woman (x) & sing (x)]

- (12) St'át'imcets articles
- | | | | | | |
|--|--|-----------------------|--------|--------|----------------------|
| | | existential assertion | | | no existent. assert. |
| | | present | absent | remote | |

- plural		<i>ti...a</i>	<i>ni...a</i>	<i>ku...a</i>	<i>ku</i> (<i>kwelh</i>)
+ plural	-collective	<i>i...a</i>	<i>nelh...a</i>	<i>kwelh...a</i>	
	+collective	<i>ki...a</i>			

The elements in (12), although encoding distinctions not present on English articles, belong to the category 'article' as we have defined

⁶ This is a simplified description of the semantics, which suffices for current purposes. See Matthewson (1998, 1999) for discussion and analysis.

⁷ For modern speakers, the article *kwelh* is marginal and these speakers have a system which contrasts the seven articles in (8) with the single article *ku*.

it above. Firstly, they correlate with argumenthood. Every argument DP must contain an element from the table in (12), and predicates may not contain one of these elements. This is illustrated in (13, 14).

- (13) a. léxlex [i smelhmúlhats-a]
intelligent [DET.PL woman(PL)-DET]
 ‘Women are intelligent.’
- b. * léxlex [smelhmúlhats]
intelligent [woman(PL)]
 ‘Women are intelligent.’
- (14) a. kúkwpi7 [kw-s Rose]
chief [DET-NOM Rose]
 ‘Rose is a chief.’
- b. * [ti kúkwpi7-a] [kw-s Rose]
 [DET chief-DET] [DET-NOM Rose]
 ‘Rose is a/the chief.’

Secondly, although the items in (12) contain deictic information, they are not demonstratives; there is a separate set of demonstratives in St’át’imcets which may either co-occur with the articles, or stand alone as arguments. This is illustrated in (15); see Matthewson and Davis (1995), van Eijk (1997) and Davis (1999) for more information about the demonstrative system.

- (15) a. ít’-em [ti7 ti smúlhats-a]
sing-INTR [DEMON DET woman-DET]
 ‘That woman sang.’
- b. ít’-em [ti7]
sing-INTR [DEMON]
 ‘That one sang.’

Lastly, these elements are non-quantificational; Matthewson (1998) argues that none of these items possess quantificational force.

We will now discuss how the St’át’imcets article system relates to the three states of speaker and hearer beliefs categorized in section 2. Recall the three possible states, repeated in (16):

- (16) A believed by speaker and hearer part of common ground
 B believed by speaker only not part of common ground
 C believed by neither speaker nor hearer not part of common ground

A-type contexts are shown in (17).⁸ In (17a), the referent of the highlighted DP is believed to exist by both speaker and hearer, by virtue of having been introduced in the preceding discourse. In (17b), the referent of the highlighted DP is in the common ground of speaker and hearer by virtue of being part of their long-term shared beliefs. In all cases, the article chosen is *ti...a*.

- (17) a. ts7a ti lí'tm-a smúlhats papt káti7 wa7 t'ak
here DET old-DET woman always DEIC IMPF go
 szácen ti ts'lá7-a...
carry DET basket-DET
 'There was this old woman_i who was always carrying a basket ...'

cw7aoz kw-a-s ka qwál'-a **ti smúlhats-a**
NEG DET-IMPf-NOM OOC speak-OOC DET woman-DET
 The woman_i didn't say anything.' (van Eijk and Williams 1981, p. 80)

- b. ka hál'h-a **ti snéqwem-a**
OOC show-OOC DET sun-DET
 'The sun appeared.'

B-type contexts are shown in (18). In these situations, the speaker has grounds for an existential assertion, but the hearer is unfamiliar with any referent satisfying the description. Again, the article chosen is *ti...a*.

- (18) a. áts'x-en-lhkan **ti wa7⁹ qwetsp píktsa** i gáp-as
see-TR-1SG.SUBJ DET IMPF move picture when.PAST evening-3CONJ
 'I saw a movie last night.'

- b. húy'-lhkan ptakwlh, ptákwlh-min lts7a **ti smém'lhats-a**
going.to-1SG.SUBJ tell.story tell.story-APPL DEIC DET woman(DIMIN)-DET
 'I am going to tell a legend, a legend about a girl.'

- c. ka hál'h-a **ti nkakúsent-a**
OOC SHOW-OOC DET star-DET
 'A star appeared.'

Finally, C-type contexts are presented in (19). Here, no referent is believed to exist by either speaker or hearer. The article chosen is *ku*.

⁸ For simplicity's sake, we present only examples which contrast the singular, present, assertion-of-existence article *ti...a* with the non-assertion-of-existence article *ku*. The same generalizations hold for all other articles.

⁹ The enclitic portion of the article, *...a*, phonetically deletes after the imperfective auxiliary *wa7*.

- (19) a. *cúz'-lhkan tsa7cw lh-t'íq-as ku qelhmémen'*
going.to-1SG.SUBJ happy HYP-arrive-3CONJ DET old.person(DIMIN)
 'If an elder comes, I'll be happy.'
- b. *cuz' mets-cál ti n-skícez7-a ku pukw*
going.to write-INTR DET 1SG.POSS-mother-DET DET book
 'My mother will write a book.'
- c. *cw7aoz kw-s áts'x-en-an ku wa7 qwetsp píktsa*
NEG DET-NOM see-TR-1SG.CONJ DET IMPF move picture
i gáp-as
when.PAST evening-3CONJ
 'I didn't see a movie last night.'

So far we have seen that A and B contexts result in the use of *ti...a*, while C contexts result in the use of *ku*. It is interesting to consider what happens if we substitute the opposite article into the sentences in (17–19) above.

When *ku* is substituted for *ti...a* in the second sentence of (17a), the highlighted noun phrase no longer picks out the referent which was introduced in the earlier sentence. The meaning of the second sentence changes to a C context, and as such the sentences are construed as pragmatically odd in the context of the preceding discourse. This is illustrated in (20):

- (20) *ts7a ti lí'tm-a smúlhats papt káti7 wa7 t'ak*
here DET old-DET woman always DEIC IMPF go
szácen ti ts'lá7-a ...
carry DET basket-DET
 'There was this old woman_i, who was always carrying a basket...'
- ! *cw7aoz kw-a-s ka qwál'-a ku smúlhats*
NEG DET-IMPf-NOM OOC speak-OOC DET woman
 'No women said anything.'

If *ku* is substituted for *ti...a* in (17b), ungrammaticality results, as is shown in (21):

- (21) * *ka hál'h-a ku snéqwem*
OOC show-OOC DET SUN

The ungrammaticality of (21) correlates with the claim that *ku* is only possible when the speaker is not able to make an existential assertion. The only possible meaning for (21) would be as in (22); this violates

the requirements of *ku*. See Matthewson (1998) for detailed discussion.

(22) $\exists x$ [sun(x) & appeared(x)]

Similar results obtain with the **B**-context sentences in (18). Where there is a higher operator which can license the use of *ku*, a *ku*-substituted version is grammatical, but the meaning changes to a **C** context. Where there is no relevant operator to license *ku*, ungrammaticality results:

- (23) a. * áts'x-en-lhkan **ku wa7 qwetsp píktsa** i gáp-as
see-TR-1SG.SUBJ DET IMPF move picture when.PAST evening-3CONJ
 'I saw a movie last night.'
- b. ! húy'-lhkan ptakwlh, ptákwlh-min lts7a **ku smém'lhats**
going.to-1SG.SUBJ tell.story tell.story-APPL DEIC DET woman(DIMIN)
 'I am going to tell a legend, a legend about a girl.'
- c. * ka hál'h-a **ku nkakúsent**
OOB show-OOB DET star-DET
 'A star appeared.'

Finally, let us see what happens if we substitute *ti . . . a* for *ku* in the **C**-context examples in (19). The resulting sentences in (24) are grammatical. However, there is a different meaning, as shown in (24). These are no longer **C** contexts, since at least the speaker, and potentially also the hearer, knows that a referent satisfying the description exists. Thus, (24a–c) are appropriate in either **A** or **B** contexts (accounting for the two different English translations).

- (24) a. cúz'-lhkan tsa7cw lh-t'íq-as **ti qelhmémen'-a**
going.to-1SG.SUBJ happy HYP-arrive-3CONJ DET old.person(DIMIN)-DET
 'There is an elder such that if s/he comes, I'll be happy.' / 'If the elder comes, I'll be happy.'
- b. cuz' mets-en-ás ti n-skícez7-a **ti púkw-a**
going.to write-TR-3ERG DET 1SG.POSS-mother-DET DET book-DET
 'My mother will write a book.' / 'My mother will write the book.'
- c. cw7aoz kw-s áts'x-en-an **ti wa7 qwetsp píktsa**
NEG DET-NOM see-TR-1SG.CONJ DET IMPF move picture
 i gáp-as
when.PAST evening-3CONJ
 'There is a movie that I didn't see last night.' / 'I didn't see the movie last night.'

The results for the three context-types are summarized in (25). In *St'át'imcets*, articles distinguish whether the existence of a referent

satisfying the relevant description is believed to exist by the speaker. The choice between *ti...a* and *ku* is independent of hearer beliefs, and hence independent of the common ground.

(25) St'át'imcets adult language article system

A	believed by speaker and hearer	believed by speaker	<i>ti...a</i>
B	believed by speaker only		<i>ti...a</i>
C	believed by neither speaker nor hearer	not believed by speaker	<i>ku</i>

4. THE PARAMETER OF ARTICLE SEMANTICS

We have seen in preceding sections that English and St'át'imcets encode different distinctions in their article systems. While English overtly encodes whether there is a referent which is in the common ground of speaker and hearer at the time of utterance, St'át'imcets overtly encodes whether or not the speaker has grounds for an existential assertion.

This cross-linguistic variation is analyzed by Matthewson (1998) as resulting from a parametric difference in the semantics of determiner systems. Matthewson observes that the absence of a common ground/non-common ground distinction in St'át'imcets articles is one instantiation of a more general prohibition against St'át'imcets articles relying on the common ground in any respect. The parameter proposed by Matthewson is given in (26).

(26) Common Ground Parameter (CGP)

Determiners may access the common ground:

Yes: {English, ...}

No: {St'át'imcets, ...}

The CGP is a semantic parameter. The claim is that the semantics of articles (i.e., their lexical entries) varies cross-linguistically. In languages with a positive setting for the parameter, lexical entries for articles may make use of notions (such as presupposi-

tion) which rely on the state of the common ground. For example, the lexical entry in (27) would be impossible in a language with a negative setting for the CGP, since it includes a uniqueness presupposition.

- (27) $[[\mathbf{the}]] = \lambda f \in D_{\langle \text{et} \rangle}$ and there is a unique $x \in D_e$ such that $f(x) = 1$. the unique $x \in D_e$
such that $f(x) = 1$ (Heim and Kratzer 1998)

We thus see that although the CGP is worded generally, it has precise semantic effects, restricting the possible denotations of articles in languages with a negative setting.

In typical parametric fashion, the CGP derives a range of different effects in St'át'imcets. For example, St'át'imcets not only lacks definite articles, it also lacks quantificational determiners such as *every* or *most*, which are generally assumed to induce presuppositions of existence (cf. Strawson 1952), and therefore to rely on the common ground (for the relationship between presuppositions and the common ground, see Stalnaker 1974, 1978 and much subsequent work). The CGP therefore accounts for the ungrammaticality of (28a, b):

- (28) a. * q'weláw'-em **tákem** syáqtsa7
pick.berries-INTR all woman
 'Every woman picked berries.'
- b. * wa7 ama-mín-itas k-wa píx-em' **tákem** twéw'w'et
IMPF good-APPL-3PL.ERG DET-IMPF hunt-INTR all boy(PL)
 'All boys love hunting.'

The CGP further accounts for the fact that St'át'imcets lacks a 'specificity' distinction in the sense of Enc (1991) or Diesing (1992); for these authors, 'specificity' involves a presupposition of existence, which is necessarily lacking in St'át'imcets articles (see Matthewson 1998 for data).

One feature of the CGP is that while the negative setting excludes the relevance of the common ground, it does not specify which particular semantic property *does* determine article distinctions. Here, we propose to strengthen the Common Ground Parameter so that it allows only two types of article system in natural language. The revised parameter is given in (29). Note that the parameter regulates possible *semantic* distinctions between

articles, and thus ignores syntactic feature differences such as gender or case distinctions.¹⁰

(29) Parameter of Article Semantics (PAS)

If a language semantically distinguishes more than one article, the distinction relies on either:

- I. Speaker beliefs (e.g. St'át'imcets), or
- II. Common ground (e.g. English)

The parameter restricts the range of possible article systems in two important ways. First, notice that based on the three context-types (A, B and C as defined above), there are five logical possibilities for ways in which article systems could divide up the belief states. These five possibilities are schematized in (30):

(30)	Logically possible article systems				
	1	AB	C	St'át'imcets, ...	
	2	A	BC	English, ...	
	3	AC	B	predict: *	
	4	A	B	C	??
	5	ABC		O'odham, ...	

¹⁰ An anonymous reviewer argues that the PAS is too narrow in its effects, since it is restricted to the domain of the article system. However, in this respect the PAS obeys the Functional Parameterization Hypothesis of Fukui (1986), Fukui and Speas (1986), which states that parametric differences must be related to functional (rather than lexical) categories (see also Borer 1983 for the prior claim that parameters must be tied to specific lexical items). It is true that the PAS does not have wide-ranging effects throughout the entire grammar; it is therefore not a 'macroparameter' in the sense of Baker (1996). We do not regard this as a disadvantage; see Davis (2001) for discussion of some conceptual and empirical problems with macroparameters.

The same reviewer also expresses reservations about the PAS on the grounds that its values are disjunctive, rather than being stateable in terms of positive or negative values of a unitary feature. However, not all parameters are of the latter type. For example, the OV/VO parameter is also formulated disjunctively. Notice, moreover, that the revised parameter makes stronger empirical predictions than the original CGP, namely that there are only two kinds of semantic distinctions made in article systems in the world's languages. If these strong predictions are upheld, this would constitute evidence for exactly this type of disjunctive parameter.

The first possibility, grouping A and B contexts together, is instantiated by St'át'imcets, among other languages such as Bemba (Bantu; see Givón 1978 and discussion in Matthewson 1998). Possibility 2, grouping B and C contexts together, is exemplified by many European languages besides English. The third possibility – grouping A and C contexts together – is not allowed by the PAS, as such a language would be basing its article distinction neither on common ground nor on speaker beliefs. To our knowledge, there are no such languages.

Possibility 4 represents the mapping of each speaker/hearer belief state to a different article. In one sense, English resembles a type-4 system, in that the so-called 'indefinite *this*' is restricted to B contexts (see discussion in Prince 1981, among others).

- (31) When I came home last night, there was **this**
turtle in my garden.

In (31), only the speaker has grounds for existential assertion, whereas the hearer does not. This might suggest that English exploits a three-way semantic distinction in its article system. However, this would only be true if B contexts exclusively used the determiner *this*. As we know, this is not the case: B contexts often use the indefinite article *a*, which can also be used in C contexts. Therefore, English cannot be considered an A versus B versus C language. We are not aware of any natural languages which do exploit this possibility. More empirical research needs to be done to determine whether such systems exist.¹¹

Finally, the fifth possibility groups together all contexts. This represents the article systems of languages which have only one article, for example O'odham, a Uto-Aztecan language spoken in the Southwestern United States (Zepeda 1983). Notice that in this type of language the PAS applies vacuously, because there is no choice to be

¹¹ Whether the PAS predicts that such languages should be disallowed depends on the (inclusive vs. exclusive) interpretation of 'or' in the wording of the parameter. Under the stronger, exclusive interpretation, the parameter says that there are only two choices for article systems: *either* Speaker Beliefs (giving rise to a St'át'imcets-type system) *or* Common Ground (giving rise to an English-type system), but not *both* (giving rise to an A/B/C system). We leave this issue open at this time.

made. Thus, languages such as O’odham do not present a problem for our analysis.¹²

The PAS thus reduces possible article systems from a logically possible five to three. But there is a perhaps more fundamental way in which our parametric analysis entails a claim about Universal Grammar. Notice that the only options permitted involve a distinction based solely on interlocutors’ beliefs about the existence of referents corresponding to noun phrases. We postulate that this type of distinction is the only one accessed by article systems.

To summarize, like the Common Ground Parameter, the revised parameter distinguishes between languages which encode a distinction based on the presence or absence of information in the common ground from those which do not. In addition, it specifies that non-common-ground-accessing determiner systems will base their article choice on speaker beliefs.

In the next section we will outline some hypotheses about English child language and present data from an experiment which tests the hypotheses. The data show that English-speaking children sometimes use the definite article *the* in B contexts. When English-speaking children overgenerate *the* in B contexts, their article usage parallels the St’át’imcets article system in that they are using the same determiner for both A and B contexts, contrasting these with C contexts.

5. ENGLISH CHILD LANGUAGE

5.1. *Hypothesis and Predictions*

Based on work on the acquisition of object placement in Dutch and Italian child language (Schaeffer 1997), Schaeffer (1999; 2000)

¹² An anonymous reviewer suggests that a very early stage of English during which children use *no* articles at all could be construed as a system of this type, with one (null) article which groups together all contexts. The issue of the early no-article system goes beyond the bounds of this paper; it could result simply from lack of knowledge of the relevant lexical items.

The same reviewer also asks about the issue of expletive articles as discussed by Longobardi (1994). While expletive articles in child language are an interesting topic to investigate (see, for example, Baauiw 2000), the data we collected do not involve the types of DP which contain expletives in adult language, according to Longobardi (e.g., proper names and generics in Italian, singular non-mass generics in English). Moreover, it is not clear from Longobardi’s work what the predictions would be about the choice of expletive article. In English and Italian, the expletive is the definite; future research is required to determine why this should be the case, and what the predictions would be for learners of either English or St’át’imcets.

hypothesizes that young children lack a pragmatic concept, the Concept of Non-Shared Assumptions, which is formulated in (32):

- (32) Concept of Non-Shared Assumptions (pragmatic) (CNSA)
 Speaker and hearer assumptions are always independent.¹³

If the CNSA is absent, speaker and hearer assumptions are not always independent, implying that there are situations in which the speaker automatically attributes her/his own assumptions to the hearer. The CNSA expresses an obligation for the speaker to consider the hearer's assumptions as a separate entity and therefore as something that is in principle different from the speaker's assumptions. (Of course, in certain cases, speaker and hearer assumptions may coincide.)

One of the many effects of lacking the CNSA concerns the distinction of articles.¹⁴ As was outlined in section 3, in adult English, the semantics of articles mandates the grouping together of contexts B and C (as opposed to A). If a child attributes her own (speaker-) beliefs to the hearer, she will not distinguish environment B (believed by speaker only) from environment A (believed by speaker and hearer). In other words, *environment B becomes environment A*. In these cases, she will use the article appropriate for environment A, which is *the* in English. Thus, in the cases in which the child does not distinguish speaker and hearer beliefs, she groups together environment A and B, as opposed to C. This developmental hypothesis is schematized in (33).

¹³ This concept might remind the reader of 'Theory of Mind'. Although we do not exclude the possibility that the phenomenon described and analysed in the present study is related to some of Theory of Mind, we choose not to explain it in terms of Theory of Mind for several reasons:

(a) from the literature on Theory of Mind it is not clear what the exact age of the acquisition of Theory of Mind is (for example, some scholars mention the age of 3;0, others 4;0, and again others 4;6);
 (b) there is no one precise definition of what Theory of Mind is, for example, whether it includes 'Point of view', whether it involves the attribution of just *false* beliefs to others or also other beliefs, etc.

We will refer to some recent studies on the interaction between Theory of Mind and language acquisition in sections 6.2 and 6.4.

¹⁴ Notice that we consider the production of articles in itself a morpho-syntactic (= grammatical) phenomenon: using the correct morpheme in a syntactic environment, namely a noun phrase. However, the realization of this phenomenon is influenced by a pragmatic concept such as the one proposed above.

- (33) Developmental hypothesis for article usage in English child language
- | | | |
|-----|---|------------|
| A/B | believed by speaker (and therefore by hearer) | <i>the</i> |
| C | not believed by speaker (and therefore not by hearer) | <i>a</i> |

The chart in (33) shows that the lack of the CNSA sometimes yields a one-to-one mapping between speaker beliefs and the form of the article. If the referent is believed to exist by the speaker, *the* is used; if no referent is believed to exist by the speaker, *a* is used. Recall from section 3 that adult St'át'imcets speakers also map one article to contexts A and B (namely *ti...a*) and another article to context C (namely *ku*). This intriguing similarity between English child language and St'át'imcets will be elaborated on in section 6. But first we turn to the predictions for English child language that follow from our developmental hypothesis in (33).

Let us first compare the schema in (33) to the adult English article system, repeated in (34):

- (34) The English adult language article system
- | | | | |
|---|--|---------------------------|------------|
| A | believed by speaker and hearer | part of common ground | <i>the</i> |
| B | believed by speaker only | not part of common ground | <i>a</i> |
| C | believed by neither speaker nor hearer | not part of common ground | <i>a</i> |

Based on this comparison, we predict that the English child will:

- (35) A. overgenerate the definite article *the* to (adult) B contexts which require the indefinite article *a*;
 B. not overgenerate the definite article *the* to C contexts;
 C. not overgenerate the indefinite article *a* to (adult) A contexts which require the definite article *the*.

In the following section we discuss some previous literature that bears on the issue of article use and the child's way of representing speaker/hearer beliefs.

5.2. Previous Literature

In his comprehensive study of the acquisition and development of functional morphemes in English child language, Brown (1973) mentions that children sometimes use the definite determiner *the* out-of-the-blue. This is exemplified by the following dialogue between the child Sarah and her mother:

- (36) Sarah: Where's the black tape? (Brown 1973, p.341)
 Mother: What black tape?

Obviously, the referent for the nominal expression *the black tape* had not been introduced in the discourse, which explains the mother's confusion.

Maratsos (1974, 1976) carried out an experimental study on this topic, namely on pre-school children's use of definite and indefinite articles. He tested two age groups, one of 3;0–3;6, and one of 4;0–5;0. In a definite-eliciting condition, comparable to our A-contexts, a story was told about a woman who had a boy and a girl. Upon the question 'Who was making noise?' the younger age group responded with a definite (*the boy/the girl*) only 55% of the time. The older age group produced correct definites at a rate of 94%.

In the indefinite-eliciting condition of his experiment, a story was told about, for example, four boys and four girls, followed up by a question, e.g. 'Who was making noise?'. Since no particular member of the class of boys or girls is established in the story, an indefinite (*a boy/a girl*) would be appropriate. This condition is comparable to our B-contexts. However, there were a considerable number of definite responses (*the boy/the girl*) in this condition, particularly among the older group (younger group: 17%, older group: 58%). On the basis of these results Maratsos argues that 'children show evidence of egocentric response'. He does not provide an adequate explanation of why the younger group seems to perform more adultlike than the older group here.

In another (but much smaller) condition, Maratsos elicited indefinites by presenting a story about, for example, a man who went to the jungle to look for a lion or a zebra (and looked for a long time). This story was followed up by the question: 'Suddenly, who came running out at the man?' The appropriate response is an indefinite (*a lion/a zebra*). In this condition, errors (definite responses) were rare: 15% (3/20) in the younger age group, and 15% (3/20) in the higher age group.¹⁵

Karmiloff-Smith (1979) conducted an extensive study of Francophone children's production and comprehension of determiners. In her production experiments, she found that children up till 8 years

¹⁵ These scenarios do not correspond to our C-contexts. Although there is no lion or zebra visible to the speaker, the child's response of 'a lion' is presumably short for 'A lion came running out at the man'. This is a purely extensional context with nothing scoping over the indefinite. We do not have an explanation for why the children in Maratsos's experiment had different error rates in these two different indefinite-eliciting conditions. Note, however, that St'át'imcets speakers would use a type A/B article in the lion/zebra condition. We will return briefly to the implications of this in footnote 30 below; thanks to Irene Heim for pointing out to us the importance of these facts.

old produced substantial numbers (39–63%) of definite articles in indefinite contexts. For example, in her ‘play-room’ experiment, the child had to ask an experimental puppet if s/he could borrow one of several identical items, which would elicit an indefinite from an adult (‘Lend me a book’). In the indefinite-eliciting condition of her ‘hide-and-seek’ experiment, in which the children had to refer to one of two identical objects (which they had seen beforehand but were not visible at the moment of the elicitation), Karmiloff-Smith found that 3-year olds gave a definite article 50% of the time, 4-year olds 15%, and 5-year olds 39%. After age 6 the percentage dropped dramatically. Karmiloff-Smith (1979, 1985) ascribes children’s (over-) production of definite determiners to the fact that children use these elements deictically, rather than anaphorically. She argues that children’s use of definite articles are drawn from a store of independently represented entries in memory and point directly to an extralinguistic stimulus, and thus function like demonstratives.¹⁶

Overgeneration of definites in indefinite contexts is also found in Schaeffer’s (1997) object scrambling experiments. She observed that if the target object was an indefinite, 2-year old children in particular often changed the indefinite determiner in the input into a definite determiner. Table I shows the frequency of this kind of response in Dutch (the asterisk indicates ungrammaticality from an adult point of view):

TABLE I
Proportions of (incorrect) definite DPs in indefinite contexts

Age	*Definite (%)
2	46
3	26
4	28
5	23
6	28
Adults	11

¹⁶ Surprisingly, in one of Karmiloff-Smith’s (1979) comprehension experiments, even the youngest age-groups correctly interpreted the definite article as referring to a singled-out object (rather than to one of several identical objects) at a rate of 85%. However, using a different task (storytelling, followed by a question), children up till 8 years old interpreted nouns with definite articles incorrectly as ‘one-of-several’, rather than as ‘(the only) one’ at very high rates (70–86%) – a result more compatible with the production data. (Thus, the different methodologies used in Karmiloff-Smith’s (1979) study seem to have influenced the results in some way.)

Zehler and Brewer's (1982) study on the sequence and principles of article acquisition reports similar results, namely that one of their (English-speaking) subject groups (ages: 2;9–3;1) produced 38% overuse of *the* in *a* contexts. They attribute this result to an overextension of a principle of long-term shared knowledge found in adult use of the article *the*, i.e. in nominal expressions such as *the sun*.¹⁷

The results of the above studies regarding the overuse of definite articles suggest that in these cases, the child has grounds for existential assertion her-/himself, and does not consider that his/her interlocutor might not. This is exactly what the lack of the Concept of Non-Shared Assumptions predicts: sometimes the child attributes his/her own assumptions (for example about the entity corresponding to the noun phrase) automatically to the interlocutor, because s/he does not consider speaker and hearer assumptions as separate.

This accords well with other long-observed phenomena in the study of child language. For example, anecdotally it is well-known that children often produce pronouns 'out-of-the-blue', i.e., they may say, for instance: 'She ate my cookie', without establishing an antecedent for *she* in the discourse (cf. Karmiloff-Smith 1985).

In contrast, in a more recent study Schafer and de Villiers (2000) investigated the use of articles by English-speaking children in a more precise fashion. They distinguished between several types of articles: 'part *the*', 'familiar *the*', 'specific *a*', 'multipac *a*', 'non-referential *a*', and 'predicational *a*'. All children in their study (ages 3;6–5;5) performed in an adultlike manner on the conditions concerning all types of indefinite *a* articles, i.e. there was no overgeneration of *the* in *a* contexts. However, note that the youngest children included in this study are relatively old, namely 3;6.

To sum up, most anecdotal and quantitative evidence suggests that our hypothesis regarding article use by young children is on

¹⁷ As was pointed out to us by an anonymous reviewer, Zehler and Brewer (1982) note that the overgeneration of *the* to *a* contexts is a comparatively late phenomenon that follows a stage of correct use of both articles, which is not predicted by our hypothesis that young children lack the Concept of Non-Shared Assumptions. However, this initial correct article use occurs during a stage in which only *a* and null articles are used. As Zehler and Brewer state themselves, "with *the* usage established, incorrect productions of this article form began to occur." Thus, the lack of errors in the initial stage seems to be due to the lack of *the* in the child's lexicon.

the right track. However, the results of previous studies are not always compatible, which might be due to the very different methodologies used. In addition, the data are not precise enough to draw conclusions with respect to all three predictions that we formulated in (35). That is, neither Maratsos (1974, 1976) nor Karmiloff-Smith (1979) systematically distinguish between the two types of indefinite articles, namely ‘believed by speaker only’ (our B contexts) and ‘believed by neither speaker nor hearer’ (our C contexts), nor do Zehler and Brewer (1982), nor does Schaeffer (1997). Furthermore, Schaeffer’s data were extracted from an experiment which was carried out to test a different phenomenon, namely object scrambling. This may have influenced the results concerning article use. Finally, despite the more detailed nature of Schafer and de Villiers’ (2000) study, it cannot tell us anything about the grammar and/or pragmatics of 2-year-old children, because their youngest subjects were 3;6. Therefore, we carried out an experiment to test precisely the three predictions formulated in (35).

5.3. *Methods*

An elicited production task was carried out with 26 monolingual English-speaking children between 2 and 4 years old in Cambridge, Massachusetts, and with 38 adult native speakers of English, who were graduate students at Boston University.¹⁸ More detailed information about the participants is provided in Table II.

Each participant was individually tested in a separate room in the presence of two experimenters, while being recorded by a video

TABLE II
Participants

Age group	Age	Mean age	# of females	# of males	Total #
Children	2;1–3;10	3;1	16	10	26
Adults	>20				38

¹⁸ In addition, some 4- and 5-year olds were tested, all of whom turned out to perform adultlike across conditions. Because of this and because of the small number of children in this age group, we decided not to include their data in our analyses.

camera. During the experiment, one experimenter noted the participant's answers on a pre-designed score-sheet. Experimenter I staged a scene or showed pictures while experimenter II played the role of a hand-puppet named Elmo, who is introduced to the child as helpless, a little silly, and absent-minded. In other words, he needs a lot of help understanding what is happening, in particular because he is always looking in a different direction when the relevant scene is being staged. In order to avoid deictic uses of *the*, the children were instructed not to point their finger at any prop or toy, but to describe them in words. At the end of each scene, Elmo asks the child what just happened. During a training session the experimenters assessed whether the child understood this cognitive task. If during the actual experiment the child did not answer, the scenario was repeated once. If after this repetition the child still did not answer, the experimenters came back to the scenario later in the experiment.

The experiment contained three conditions, as listed in (37):

- (37) (a) A context: *the* required for adults;
(b) B context: *a* required for adults;
(c) C context: *a* required for adults.

Each condition was tested in at least three different scenarios. The participants were presented with 9 items for condition A, 3 items for condition B, and 6 items for condition C. This guaranteed a balance between contexts requiring *the* and contexts requiring *a*. The total number of 18 test items was interspersed with 12 other items, testing a completely different grammatical topic, namely verb-particle constructions. The two types of test items served as fillers for each other. To accommodate to the participants' attention spans, each experimental session was divided up into three (or more, if necessary) parts. Half of the participants were presented with the test items in one randomization, while the other half received another randomization. For the actual test items and orders of presentation, see the appendix.

In order to establish the clearest possible distinction between the two indefinite contexts (B and C), we chose to make use of 'existence' versus 'non-existence' of the entity corresponding to the noun phrase. If there is an existing entity corresponding to the noun phrase, which can be sensed by the speaker, we take the context to be B (believed by speaker only). On the other hand, if a complete corresponding entity

is absent, we assume there is no entity believed to exist by either speaker or hearer and the context is C.¹⁹ Examples of all three experimental conditions are given in (38) (the asterisk indicates that the answer is ungrammatical from an adult's point of view):

- (38) A. A context : *the* required for adults
 Situation: car on table
 Elmo: Hey, who is this (pointing at Donald Duck)?
 Child: Donald Duck!
 Elmo: And this (pointing at the car on the table)?
 Child: A car!
 (Donald Duck pushes the car)
 Elmo: What did Donald Duck just do?
 Child: He pushed **the** car. He pushed *a car. He pushed *car.
- B. B context : *a* required for adults
 Situation: picture of Mickey Mouse who just finished drawing a house
 Elmo: Hey, who is this (pointing at Mickey Mouse)?
 Child: Mickey Mouse!
 Elmo: And what did Mickey Mouse just do?
 Child: He drew **a** house. He drew *the house. He drew *house.

¹⁹ The assumption that a non-complete object corresponds to a C context is based on scrambling facts from Dutch. In Dutch, an indefinite direct object can scramble only if the referent is believed to exist by the speaker (our B context). The property of being complete vs. incomplete seems to play an important role in deciding whether the object is part of a B context. Consider the following pair of sentences:

- (i) Mijn moeder is langzaam een bureau aan het bouwen
 my mother is slowly a desk at it build.inf
 'My mother is slowly building a desk'
- (ii) *Mijn moeder is een bureau langzaam aan het bouwen
 my mother is a desk slowly at it build.inf

In both (i) and (ii) it is clear from the use of the creation verb *bouwen* ('to build') that the indefinite direct object *een bureau* ('a desk') is an incomplete object. In (i) the object *een bureau* ('a desk') remains unscrambled: it follows the adverb *langzaam* ('slowly'), suggesting that it has no referent and resulting in a grammatical sentence. However, in (ii) the direct object has scrambled, which renders the sentence ungrammatical. The only way for this sentence to be grammatical is for the object to correspond to a referent. This shows that incomplete objects cannot function as a referent and must thus correspond to a C context.

C. C context: *a* required for adults

(i) incomplete object

Situation: picture of Bert painting a car (NOT finished)

Elmo: Hey, who is this (pointing at Bert)?

Child: Bert!

Elmo: And what is Bert doing?

Child: He's painting a car. He's painting *the car. He's painting *car.

(ii) non-existing object

Big Bird: Oh, I'm so bored. I don't know what to do. Oh, you know what, I'm going to the forest, and I'm gonna DRAW something there.

Elmo: What do you think Big Bird is gonna do in the forest?

Child: He's gonna draw a tree. He's gonna draw *the tree.
He's gonna draw *tree.

In cases where a participant self-corrected, only the first response was counted. For the analysis of the data we made use of both the manually kept score-sheets and the video tapes. Special notes were made about non-verbal behaviour. Furthermore, it should be noted that the children who participated in the experiment generally articulated well, which diminished the risk of interpreting *a* as *the*, or vice versa. Any unclear cases were excluded from the analyses.

Finally, in order to ensure that the indefinite article *a* is obligatory for adults in our B contexts, rather than merely preferred, we carried out an additional experiment with adults, a Felicity Judgment Task (Chierchia et al. 1997).²⁰ In this experiment, adults were asked to judge a puppet's description of B context scenarios to another puppet (who does not pay attention and looks away), according to the following scale: 1 = fine/good English/the way you would normally talk; 2 = not so great/sounds a bit funny/not the way you would normally say it but not completely bad; 3 = bad/ungrammatical/wrong in the context. Three items contained the (correct) indefinite article *a*, and three items the (incorrect) definite article *the*. These six test items were presented in random order, alternated by fillers, to 28 adult native speakers of English, students at the University of British Columbia, who were asked to write down their responses on a score-sheet. The participants were divided into two groups – one group of 19 participants, and one group of 9 – who each received a different test item randomization.

The results of this experiment show that the B contexts containing the indefinite article *a* were judged as '1' 88% (74/84) of the time, as

²⁰ Thanks to an anonymous reviewer for suggesting this additional experiment.

'2' 12% (10/84) of the time, but never as '3' (0/84). (Moreover, several of the '2' responses were judged to be non-perfect for irrelevant reasons; for example, participants wrote comments which corrected the verb from 'paint' to 'draw'.) On the other hand, the B contexts containing the definite article *the* were judged as '2' or '3' at a rate of 85% (55/65), and as '1' at a rate of 15% (10/65).²¹ These percentages suggest that *a* is indeed obligatory for adults in B contexts, and that *the* is infelicitous.²²

5.4. Results

Returning to the original experiment with children, Table III presents the results concerning the overgeneration of the definite article *the* in B contexts.

TABLE III
Overgeneration of the in B contexts²³

Age group	<i>the</i> in B contexts
Children (2;1–3;10)	25% (19/76)
Adults	2% (2/113)

²¹ The total of B contexts containing *the* is 65, rather than 84. The reason for this is that in randomization 2, one test item (a B context with *the*) yielded very anomalous results with respect to all other B contexts, and with respect to the exact same test item in the other randomization. The anomalous test item in randomization 2 was judged '1' by 17 out of 19 participants. The same item in the other randomization behaved as predicted, yielding '1' responses from only 2 out of 9 participants. We think that what happened was that the article was not pronounced properly in randomization 2; it sounded very much like *a*. Therefore, we excluded this item from our analysis in this group (84 – 19 = 65).

²² Although adult speakers realize that speaker and hearer beliefs are independent, the correct use of English determiners also requires the speaker to know precisely how many assumptions s/he can attribute to the hearer. Mistakes can be made in this: English-speaking adults sometimes inappropriately use *the* in B contexts. These are cases of 'presupposition failure' (and account for the 2% over-generation of *the* by adults in Table III below). Conversely, hearers often *accommodate* presuppositions when they hear *the* in a context where they lack the required prior knowledge. These are cases of 'presupposition accommodation', and we hypothesize that this is what is behind the fact that in our Felicity Judgment Task, *the* was judged to be 'fine' in B contexts 15% of the time. This interpretation of the results is supported by comments given by experiment participants, along the lines of 'I assumed that the puppet already knew about X'.

The 2/3-year-old children produce 25% occurrences of *the* instead of *a* in B contexts, in contrast to the adults, who virtually never overgenerate *the* in B contexts (2%).

Some child examples are given in (39):

(39) B contexts:

- a. Situation: picture of Minnie Mouse who just finished drawing a car
 Elmo: Hey, who is this?
 Child: Minnie Mouse!
 Elmo: And what did Minnie Mouse just do?
 Child: draw **the** car (TO, 3;0)
 Child: she paint **the** car (AS, 2;8)
- b. Situation: picture of Cookiemonster who just finished drawing a house
 Elmo: Hey, who is this?
 Child: Cookiemonster!
 Elmo: And what did Cookiemonster just do?
 Child: He draw **the** house (MX, 2;7)
 Child: She paint **the** house (AS, 2;8)
 Child: made **the** house (MY, 2;10)
- c. Situation: picture of Ernie who just finished building a castle
 Elmo: Hey, who is this?
 Child: Ernie!
 Elmo: And what did Ernie just do?
 Child: he pointed at **the** building. (AL, 2;7)

None of these responses were accompanied by a pointing gesture. This suggests that the children were not using the article *the* deictically.

Table IV contains the data concerning C contexts: the children overgenerate *the* in C contexts 5% of the time; the adults 3%.

TABLE IV
Overgeneration of the in C contexts

Age group	<i>the</i> in C contexts
Children (2;1-3;10)	5% (7/137)
Adults	3% (6/188)

²³ The children did not always respond to the test question. For example, in the second row of Table III we see that the three items in Condition B, which were shown to 26 2- and 3-year-old children, should result in 78 responses. However, the total number of responses is 76. This means that for 2 of the test items there was an irrelevant response (including occasional omissions of the articles), or no response at all.

Finally, Table V reflects the participants' performance on article usage in A contexts.

TABLE V
Overgeneration of a in A contexts

Age	<i>a</i> in A contexts
Children (2;1-3;10)	2% (5/203)
Adults	2% (7/311)

Both children and adults hardly ever overgenerate *a* in A contexts, which require *the*. Interestingly, most of the errors that do occur (across age-groups) come from scenarios with the verb *to eat*, such as *eating a banana*. Whether the verb *to eat* has some special properties encouraging the use of the indefinite article *a* remains to be investigated.

A two factor analysis of variance (ANOVA) was performed on the accuracy obtained from each subject. The first factor was age with two levels (2/3-year-old children, and adults) that served as between subjects for the subject analysis. The second factor was item type with three levels (A contexts, B contexts, and C contexts) that served as within subjects for the subject analysis.

We found a significant main effect of age [$F(1, 62) = 12.52$, $MSe = 0.025$, $p < 0.01$] stemming from the fact that the children made more errors than the adults. More interestingly, there was a significant interaction between context and age-group [$F(2, 124) = 11.16$, $MSe = 0.02$, $p < 0.01$]. Further analysis of the interaction revealed a significant difference between children and adults for B contexts [$F(1, 62) = 34.34$, $MSe = 0.027$, $p < 0.01$], but not for A or C contexts [$F < 1$].²⁴

Additional comparisons between item types (contexts) for the children showed a significant difference between B contexts on the one hand and A and C contexts on the other hand [$F(2, 62) = 7.76$, $MSe = 0.026$, $p < 0.01$], reflecting a higher error rate for the B contexts than for the A and C contexts. In contrast, the children did not show any difference between A and C contexts [$F < 1$]. Unexpectedly, the adult group also showed a significant difference between B con-

²⁴ Up to this point, our statistical analysis has tested all possible statistical differences. Any additional analysis depends on the results of the analysis described so far. With this caveat, we present the additional planned comparisons between the contexts in the child and adult groups, asked for by one of the reviewers.

texts on the one hand and A and C contexts on the other hand [$F(2, 62) = 16.53$, $MSe = 0.026$, $p < 0.1$], but in the opposite direction: their accuracy in the B contexts was higher than that in the A and C contexts. In addition, the adults' accuracy in the A contexts was significantly higher than in the C contexts [$F(2, 62) = 4.76$, $MSe = 0.03$, $p < 0.05$].

No other effect was significant.

5.5. Discussion

The results presented in section 5.4 demonstrate that all three predictions are borne out. Young English-acquiring children overgenerate *the* in B contexts (Prediction A, Table III); they do not do so in C contexts (Prediction B, Table IV), and they do not produce *a* in A contexts, which require *the* (Prediction C, Table V).²⁵ Thus, our results provide evidence in favour of the hypothesis that English-speaking children sometimes fail to distinguish B contexts from A contexts and therefore group together A and B contexts, as opposed to C, due to the lack of the pragmatic Concept of Non-Shared Assumptions.²⁶

As the reader might have noticed, our CNSA looks very similar to Theory of Mind. We are hesitant to use the cognitive concept of Theory of Mind to explain our results because neither the age of acquisition nor the definition of Theory of Mind is clear in the lit-

²⁵ Karmiloff-Smith (1979, 1985) argues that children have an initial preference for a deictic use of definite articles. In principle, this idea is compatible with our findings, although deictic use of articles is often accompanied by pointing gestures, and we did not observe any of those with *the*. What we did find were responses containing demonstratives, such as *this* or *that*, accompanied by a pointing gesture. These responses were scored as irrelevant, and excluded from the analysis. Nevertheless, even if children do tend to use articles deictically initially, the question as to why they do this remains to be answered.

²⁶ Two anonymous reviewers argued that the experimental situations for B contexts (e.g. 38B) do not in fact require an indefinite article in adult English, and one reviewer claimed that the experimental situations for A contexts (e.g. 38A) do not require a definite article in adult English. However, these suspicions are contradicted by the adult responses in the experiment, as we outlined above. Adults gave *the* responses in B contexts in only 2% of cases, and gave *a* responses in A contexts in only 1% of cases. The reviewers' suspicions are also contradicted by the follow-up experiment reported on at the end of section 5.3. In the follow-up experiment, the adults behaved as predicted not only for B contexts (as explained above), but also for A contexts. Participants judged A contexts with *the* to be good 96% of the time (81/84), and A contexts with *a* to be good only 31% of the time (26/84).

erature. In addition, if we assumed that, for example, 2-year-old children lack Theory of Mind, it would be difficult to explain why they often produce adultlike articles. In other words, the lack of Theory of Mind does not allow adultlike article use. Schafer and de Villiers (2000) explain this fact by assuming that none of the child productions of *the* are actually adultlike, even though they seem adultlike. They propose that at this stage the child has a grammar containing the (child) syntactic category ‘theP’, which later develops into the adult DP. The problem is that even in their study, the children use *the* correctly between 47% and 96% of the time, high percentages, too high we believe, for the assumption that these are different from the adult usage of *the*. Furthermore, as they note themselves, they fail to find better performance by their oldest two age groups than their youngest two, a difference they expected to find, based on their assumption that Theory of Mind is acquired around the age of 4.

Schafer and de Villiers justify this by adopting Hollebrandse’s (1998) proposal that some grammatical repercussions of Theory of Mind are not observed in the grammar until well over a year after children pass Theory of Mind tests. Although interesting, Schafer and de Villiers’ study confirms our hesitations regarding Theory of Mind and its implications for the acquisition of grammar. Therefore, we maintain the hypothesis that young children lack the pragmatic Concept of Non-Shared Assumptions and leave the relationship between this pragmatic concept and Theory of Mind open for future research.

As we have mentioned before, the English-speaking children’s behaviour shows striking parallels with adult St’át’imcets. In the next section we provide an analysis unifying the English child data with the analysis outlined in section 4 for the two adult article systems.

6. UNIFIED ANALYSIS

6.1. *Similarity and Difference Between Adult St’át’imcets and Child English*

How do the English child data relate to our Parameter of Article Semantics? As the English child data in section 5 show, article usage in English child language partially resembles the article system of adult St’át’imcets. In the cases in which English-speaking children overgenerate the definite article *the* in B contexts, they appear to

group together contexts A and B, which is exactly what adult St'át'incets speakers (always) do in their article usage. English adult speakers, on the other hand, consistently group together B and C contexts, as opposed to A contexts. Notice that the child English article system and the adult St'át'incets article system are not entirely parallel. English-speaking children *optionally* group together A and B, whereas adult St'át'incets speakers *obligatorily* do so in their article choice. In this section we propose an analysis that accounts for both the similarity and the difference between the child English article system and the adult St'át'incets article system.

6.2. *Parameter Setting and Misanalysis*

Research in First Language Acquisition has shown that parameters are set very early (see Hyams 1992, 1996; Wexler 1998). These parameters include the V2 parameter, the verb-to-tense (verb raising) parameter, word order parameters like VO or OV, and the null-subject parameter. This leads us to expect that the PAS is set correctly very early, too. Thus, we propose that adult St'át'incets has set the PAS for value I (Speaker beliefs), while English child language has already correctly chosen value II (Common ground).

The question immediately arises as to how the English-speaking children have managed to set the parameter correctly. Assuming that each parameter has an unambiguous trigger, we suggest that for the PAS the B contexts (speaker beliefs-only) fulfill this function. What is required for a child to set the parameter to the English value is to hear the article *a* (the same article as is used in C contexts), in a context in which the child is not aware of the existence of any referent. An example is given in (40).

(40) B context:

Adult to child: Hey, there's a skunk outside!

The utterance in (40) demonstrates to the child that the speaker is aware of the existence of a referent for the indefinite noun phrase *a skunk*, but importantly, the hearer (the child) knows that she herself lacks any such knowledge. This type of context crucially differentiates English from St'át'incets, since in St'át'incets any such sentences in parallel contexts would contain the article *ti...a* rather than *ku*.

B contexts are readily available in the input from the beginning of language acquisition on. The claim that they are recognized by English-speaking children is supported by their frequent correct use

of *a* in these environments (70% by 2-year-olds). We argue that the fact that English-speaking children often use the correct article in B contexts is explained by the early correct setting of the PAS.^{27, 28}

The correct setting of the PAS explains the (optionality vs. obligatoriness) difference between English child language and adult St'át'incets as follows: besides (incorrectly) grouping together A and B contexts, English-speaking children also often correctly categorize B plus C as a group, as opposed to A, whereas adult St'át'incets always groups together contexts A and B.

The similarity between the St'át'incets article system and the optional English child language article system results from the fact that the St'át'incets system does not distinguish common ground (A) contexts from speaker beliefs-only (B) contexts. This is precisely where 2- and 3-year-old English speakers have problems: even though they have set the PAS correctly, they sometimes mistakenly believe that their own beliefs are shared by the hearer, i.e. are part of the common ground (resulting from the absence of the Concept of Non-Shared Assumptions). In other words, they sometimes misanalyze B contexts as A contexts. In effect, this temporarily cancels the status of context B as a separate, relevant environment, thus rendering merely a distinction between A and C contexts. When this happens, value I of the PAS becomes the same as value II. The result is that in these cases, English-speaking children produce one article (*the*) in adult A and B contexts, and another one (*a*) in C contexts, parallel to adult St'át'incets speakers. However, for the English-speaking children, this is caused by a temporary neutralization between value I and II,

²⁷ An alternative analysis of our data could be that children leave the PAS unset initially, and go back and forth between the two values. However, this would render the so-called 'Pendulum Effect', undesirable in terms of learnability (see Randall 1990).

²⁸ A reviewer asks how English-speaking children can set the parameter correctly without already possessing the CNSA; the reviewer's idea is that setting the parameter correctly involves distinguishing A from B contexts, yet distinguishing A from B contexts requires the CNSA. The solution to this apparent paradox relies on two plausible assumptions. First, we assume that before the child has acquired the CNSA, s/he does not *always* distinguish speaker from hearer beliefs, but may *sometimes* do so. Second, the setting of the parameter does not require the *consistent* recognition of B contexts. Since in St'át'incets, B contexts exclusively contain the article *ti...a* we argue that it is sufficient for an English-speaking child to hear *a* in a number of recognized B contexts to realize that s/he is not learning St'át'incets.

whereas Sta't'incets adult grammar makes use of value I of the PAS.²⁹

Our claim that English-speaking children have already set the PAS correctly contrasts with a possible alternative analysis, namely that these children have initially *mis-set* the parameter, and are in the process of re-setting it to the correct (English) value. These two analyses are difficult to distinguish empirically based on article usage alone; however, they make differing predictions for other areas of the grammar. We will return to this issue in section 7.3 below.³⁰

Technically, the adult St'át' incets article system could also be accounted for by the absence of the Concept of Non-Shared Assumptions. Thus, there might seem to be some overlap between the function of value I of the Parameter of Article Semantics and the absence of the CNSA. However, first of all, it is of course conceptually undesirable to state that St'át'incets adults lack the CNSA, as they are pragmatically mature, just like any other adults. Secondly, the fact that in English the Parameter of Article Semantics and the lack of the Concept of Non-Shared Assumptions result in different article patterns empirically justifies the existence of two different mechanisms affecting the choice of articles: one syntactic, and one pragmatic. Finally, as we will discuss below, there are many places in the rest of St'át'incets grammar where the CNSA is made use of.

²⁹ An anonymous reviewer pointed out that alternatively, the English child could have a representational (= grammatical) deficit: speaker-oriented features are acquired before hearer-oriented features. In principle, this view is not incompatible with our account, since we discuss the reason *why* children would use the grammatical speaker-oriented features earlier or rather, more readily than the hearer-oriented features, namely, the lack of the Concept of Non-Shared Assumptions. However, if the deficit were indeed purely representational, the optionality of the overgeneration of *the* in English child language would not be accounted for: it would imply that children would use *the* in *all* B-contexts, which is not the case.

³⁰ There is suggestive evidence from one of Maratsos's experiments that English-acquiring children have not simply mis-set the parameter for the St'át'incets setting (see footnote 15 above). In one of Maratsos's conditions, children had low error-rates, mistakenly using *the* only 15% of the time. In the same condition, St'át'incets-speakers use the A/B context article *ti . . . a*. Our experiments did not test this type of condition, and we do not have an explanation at this time for the disparate results in Maratsos's different indefinite-eliciting conditions. However, it seems that a parameter mis-setting analysis would have difficulty accounting for the non-St'át'incets-like behaviour of children in one of Maratsos's conditions. Thanks to Irene Heim for pointing this out to us.

Thus, the option of accounting for adult St'at'imcets article use by means of a supposed absence of the CNSA is empirically unviable.

The transition to the adult use of articles results from the acquisition of the Concept of Non-Shared Assumptions. We suggest that this pragmatic concept is triggered by communication breakdowns such as the one in (36) above: the child uses the wrong morpheme, in this case *the* in a B context, and the mother does not understand what he is referring to. Similar miscommunications occur when pronouns are used out-of-the-blue, or lexical items such as *too*, *also*, *again*, *more*, *other*, which require shared speaker and hearer beliefs (see section 7.2).

6.3. *Implications for Language Acquisition Theory*

Everybody agrees that language development exists: the child must get from an initial state of absence of knowledge of a specific grammar to knowledge of a grammar more or less identical to that of the adult language s/he is exposed to. The question is whether principles of Universal Grammar are available to the child from the beginning or not. We can identify three possible views concerning the form a child's grammar can take during development. They differ from each other with respect to how much they assume the child's linguistic representations to be constrained by principles of UG. A description of the three hypotheses is provided in (41) (this taxonomy is taken from Goodluck 1991; Weissenborn et al. 1992).

(41) a. *The Strong Continuity Hypothesis*

From the onset of language acquisition, all principles of Universal Grammar are available to the child and at each point in time the grammar of the child allows only for structures that are also structures of the target language (Poeppel and Wexler 1993, Lust et al. 1994, among others).

b. *The Weak Continuity Hypothesis*

During development, the grammar of the child permits structures that are impossible or only marginally possible in the target language but are possible structures in other languages, that is, they obey principles of Universal Grammar. Moreover, the principles are used in such a way that each non-adult grammar corresponds to a 'possible human language' (cf. Otsu 1981; White 1981;

Klein 1982; Hyams 1983; Pinker 1984; Clahsen 1992, among others).

c. *The Maturation Hypothesis*

At least some principles of Universal Grammar mature. That is, some properties of grammar are biologically programmed to emerge only after a certain period of development. If such a property is an absolute universal (i.e. holds obligatorily for structures and rules to which it is relevant), then child grammars may of necessity fall outside the range of ‘possible human languages’ (Felix 1987). However, maturation itself does not necessarily imply systems that violate Universal Grammar. Borer and Wexler (1987, 1988), for example, assume that maturation is ‘UG constrained’.

From the way in which the three hypotheses are formulated above, our analysis in section 6.1 seems to support the Weak Continuity Hypothesis. However, in the following we will argue that our analysis is actually closer to the Strong Continuity Hypothesis.³¹

We agree with the claim that child language is constrained by adult UG principles from the very beginning. More specifically, we believe that the Parameter of Article Semantics is available and correctly set in early grammar. Thus, the grammar regarding article semantics is intact from very early on. However, regarding pragmatics we take a different point of view. We adopt the idea that, although pragmatics is a subcomponent of language, it is not part of the computational system (which UG is) (cf. Chomsky 1993). This leads us to believe that pragmatics can be learned, as opposed to UG, which is innate. The pragmatic system is gradually built up by gathering experience. This implies that not all pragmatic principles are available initially. In this particular study, we suggest that the pragmatic Concept of Non-Shared Assumptions is absent in early child language. This induces syntactic/semantic (= grammatical) effects (overgeneration of *the*).

Thus, despite the fact that children produce strings of words that deviate from their adult counterparts, we claim that children’s and

³¹ The Strong Continuity Hypothesis only makes claims about the Principles of UG, not about the parameters. Among the defenders of the Strong Continuity Hypothesis there is a debate as to whether parameters are set correctly early (as argued by, for example, Ken Wexler, Nina Hyams), or whether parameter setting takes time (as argued by, for example, Barbara Lust).

adults' grammars (both universal and language particular) are identical. The differences result from different pragmatic systems. If this claim can be maintained throughout the different areas in which children differ from adults in their linguistic behaviour, it is the Strong Continuity, rather than the Weak Continuity Hypothesis which is supported, given that the hypotheses as formulated above are strictly about (universal and language particular) grammar, and not about pragmatics. Therefore, we propose to reformulate the Strong Continuity Hypothesis as in (42):

- (42) *Strong Continuity Hypothesis –revised*
- (i) From the onset of language acquisition, all principles of Universal Grammar are available to the child.
 - (ii) As soon as the relevant input is available, children will construct language particular grammars (i.e. set parameters) which are consistent with the grammars of their target language.
 - (iii) Any structures deviating from target language structures result from an immature pragmatic system.

Concluding, our study supports a Strong Continuity Hypothesis of First Language Acquisition which states that child structures never violate either UG or the particular grammar of the target language.

7. FURTHER PREDICTIONS

In the previous two sections, we have seen that the lack of the Concept of Non-Shared Assumptions, which is a feature of child language in general, happens to influence English-speaking children's behaviour with respect to the use of articles. In their article usage, they optionally resemble St'át'imcets adult speakers. So far, we have not made any claims about St'át'imcets child language. In this section, we begin by laying out our predictions for article choice by St'át'imcets 2- and 3-year-olds. We then turn to areas of the grammar other than article usage, formulating predictions that follow from our analysis for both English child language and St'át'imcets child language. We will see in section 7.3 that our analysis is empirically distinguishable from an alternative analysis, according to which the English-speaking children have initially mis-set the PAS to the St'át'imcets value.

7.1. *Predictions for Article Usage by St'át'imcets Children*

We have argued above that children immediately set the PAS correctly. This entails that St'át'imcets children have already set the parameter to the value I (Speaker beliefs). Since this setting does not require the child to distinguish between speaker and hearer beliefs when they choose an article, the fact that St'át'imcets 2-year-olds have not yet acquired the CNSA will not affect their article usage. In particular, we do not predict any errors in the article use of St'át'imcets children. They will consistently group together A and B contexts, as opposed to C contexts.

Unfortunately, there are at present no children acquiring St'át'imcets; the only speakers are elderly. Therefore, we are currently unable to test this prediction.

7.2. *Predictions for Other Grammatical Areas Involving the Common Ground*

The lack of the CNSA has an effect not only on article systems in languages such as English, but on any aspect of language that involves the common ground. This is because items which put constraints on the content of the common ground require the speaker to make sure that the hearer shares his/her beliefs; by definition this presupposes that the hearer has potentially different beliefs.

As we briefly mentioned in section 5.2, young children tend to use pronouns 'out-of-the-blue', i.e. they produce pronouns without establishing an antecedent. This could be explained by the lack of the CNSA. When the child attributes his/her own assumptions to the hearer, there is no need to establish an antecedent for a pronoun: the speaker (the child) knows the entity that the pronoun refers to, which is sufficient in this case.

Another example consists of presuppositional lexical items such as *too*, *also*, *again*, *more*, *other*, which require shared speaker and hearer beliefs. This is illustrated in (43) (derived from *Alice in Wonderland*):

- (43) A: Do you want more tea?
 B: I can't have more, I haven't had any yet!

A's use of the noun phrase *more tea* presupposes the prior existence of tea drunk by B. Similar results hold for *too*, *also*, *again*, *other*, etc.

If children lack the CNSA, we predict that they will overgenerate words such as *more*, *too*, *also*, *again* or *other* to contexts which involve speaker beliefs only. Thus, we expect the following hypothetical dialogue to be possible:

- (44) (Child coming home from day-care)
 Child: Tresa played in the sandpit too!
 Adult: Tresa played in the sandpit too? So who else played in the sandpit?

In (44), the word *too* induces a presupposition that somebody other than Tresa played in the sandpit. In adult language, the usage of *too* requires that both the speaker and the hearer believe this. This utterance is predicted to be felicitous in child language, because the lack of the CNSA allows the child to attribute his/her own assumptions to the hearer. The adult's response in (44) represents a breakdown in communication resulting from the child's use of *too* in a context where only the speaker is aware of the fact that somebody other than Tresa played in the sandpit.

Since we claim that children in general lack the CNSA, this prediction should not hold only for English child language, but also for St'át'imcets child language. Therefore, we predict that a St'át'imcets child could utter the following sentence in a context where only the speaker is aware that somebody other than Tresa played.

- (45) Child: say'sez' kw-s Tresa t'it
 play *DET-NOM* Tresa *also*
 'Tresa played too.'

In summary, besides the differences in article usage between English-speaking children and adults, we also predict differences in any areas of the grammar which necessitate a distinction between speaker beliefs and hearer beliefs. Furthermore, while no differences are predicted between the article usage of St'át'imcets-speaking children and adults, we do predict differences in other language areas making crucial use of a speaker/hearer beliefs distinction.

Theoretically speaking, we would also predict that children make errors in cleft constructions. Clefts are constructions which require prior shared beliefs on the part of both speaker and hearer. In the example in (46), the hearer as well as the speaker needs to believe that there was a previous event of somebody barging into the speaker's office.

(46) It was Gerda who barged into my office.

Children who have not yet acquired the CNSA would be predicted to produce these sentences out of the blue. However, as the literature on child language amply demonstrates, children of the relevant age, namely 2 and to a lesser extent 3, do not produce relative clauses yet. Therefore, this prediction is unfortunately not testable.

7.3. *Comparison with the Predictions of a 'Parameter Mis-setting' Analysis*

In several places above, we mentioned the alternative possibility of an initially mis-set PAS in order to explain our English child data. In this sub-section we demonstrate that our analysis is empirically distinguishable from such an explanation.

First of all, because of the discrete nature of parameters, a mis-set PAS (for value I = Speaker Beliefs) would not explain why English-speaking children often (70%) behave in an adultlike manner with respect to article usage.

Secondly, and more importantly, there is a difference between the two analyses concerning presuppositional items which occur outside the article system. Unlike our analysis, the parameter mis-setting analysis does not predict any correlation between the acquisition of articles and the correct usage of other presuppositional items. Since the two adult languages under consideration do not differ in terms of presuppositional items outside the article system, the parameter which differentiates the adult languages *must* refer only to the article system itself. Therefore, an analysis according to which the English-speaking children have mis-set the article parameter does not make any predictions about their ability to use other presuppositional items correctly.

In order to test these differing predictions, a production experiment involving presuppositional items outside the article system would be required. At the present time, no such experiment has been carried out. Therefore, at this time we must restrict ourselves to observing that our analysis is capable of deriving the facts, and to laying out the further predictions as we did above in section 7.2. A conclusive

refutation of the ‘parameter mis-setting’ analysis must await further research.³²

8. CONCLUSION

In this paper we have provided an analysis which accounts for the use of articles in English adult language, English child language, and St’át’imcets adult language. We described a striking similarity between English child language and St’át’imcets. This similarity consists in the fact that (unlike in adult English), all contexts in which the speaker has grounds for an existential assertion are grouped together under one article, regardless of the state of the hearer’s beliefs. While this phenomenon is obligatory in St’át’imcets, it is optional in English child language.

In order to account for these facts we proposed a parameter, the Parameter of Article Semantics, which allows natural languages to make their article distinctions based only on one of two options: Common Ground or Speaker Beliefs. St’át’imcets opts for the first value, whereas English chooses the second. In line with recent research on parameter setting, we argued that the PAS is immediately set correctly in both St’át’imcets and English.

In order to account for the optional St’át’imcets-like behaviour of English-acquiring children, we proposed that children lack a pragmatic concept, namely the Concept of Non-Shared Assumptions. The CNSA states that speaker and hearer assumptions are always independent. The lack of this concept causes English-speaking children to sometimes not distinguish common ground (A) contexts from speaker beliefs-only (B) contexts. Even though they

³² Matthewson et al. (2001) report on a preliminary experiment designed to test whether English-speaking children (who are still making errors in their article usage) understand the requirements placed on the common ground by presuppositional items. This was a comprehension experiment; the children were found to be capable of challenging presupposition failures. An example is given in (i).

(i) Experimenter: “Do you want more soup?” (asked at time when child has not eaten soup)
 Child: “I didn’t drink no soup.”

These results are in line with our prediction that the CNSA must be acquired before article usage becomes adult-like in English. However, as noted in the text, a production experiment is required for parallelism with the experiment reported on in this paper. Moreover, there are many other differences between Matthewson et al.’s experiments and the one we report on here, so we hesitate to draw any solid conclusions from results such as in (i).

have set the PAS correctly, they do not consistently realize that the common ground is distinct from speaker beliefs. This has the effect that in these cases, English-speaking children base their choice of articles solely on speaker beliefs, just like the St'át'imcets adult speakers. However, for the English-speaking children, this is (a misanalyzed) value II of the PAS, while for the St'át'imcets adults it is value I.

In terms of Language Acquisition Theory, our analysis supports a revised version of the Strong Continuity Hypothesis: from the onset of language acquisition children's grammars obey all principles of Universal Grammar and of the particular target grammar. Any structures deviating from target language structures result from an immature pragmatic system.

Finally, we predicted that as long as the Concept of Non-Shared Assumptions fails to apply, children acquiring any language will over-generate utterances containing items which involve the common ground, such as *more*, *too*, *again* and pronouns.

APPENDIX A: EXPERIMENTAL SCENARIOS AND THEIR RANDOMIZATIONS

The particle verb scenarios (1–6) and their simple verb counterparts (7–12) served as fillers for the present study. For the order of presentation we refer to the end of this appendix.

Particle Verbs

- | | | |
|-----|--|-------------------|
| (1) | Particle verb – Full object DP | throw away |
| (2) | Particle verb – Full object DP | turn on |
| (3) | Particle verb – Full object DP | pick up |
| (4) | Particle verb – Pronominal object (it) | throw away |
| (5) | Particle verb – Pronominal object (it) | turn on |
| (6) | Particle verb – Pronominal object (it) | pick up |

Simple Verbs

- | | | |
|------|--------------------------------------|-------------|
| (7) | Simple verb – Full object DP | wash |
| (8) | Simple verb – Full object DP | kick |
| (9) | Simple verb – Full object DP | eat |
| (10) | Simple verb – Pronominal object (it) | wash |
| (11) | Simple verb – Pronominal object | kick |
| (12) | Simple verb – Pronominal object | eat |

Articles

- (13) definite (referential/existent) **the apple**
Situation: one apple and one orange on table
 Elmo: Hey, what are these?
 Child: an apple, and an orange!
 (Pluto comes on stage and starts to eat the apple)
 Elmo: Hey and there is Pluto! What is Pluto doing?
 Child: Pluto/He is eating **the** apple.
 *Pluto/He is eating **an** apple.
- (14) definite (referential/existent) **small ball**
Situation: big and small ball on table
 Elmo: Hey, what are these?
 Child: a big ball and a small ball!
 (Goofy comes on stage and starts to kick the small ball)
 Elmo: Hey and there is Goofy! What is Goofy doing?
 Child: Goofy/He is kicking **the** small ball.
 *Goofy/He is kicking **a** small ball.
- (15) definite (referential/existent) **the car**
Situation: a car and a cup on table
 Elmo: Hey, what are these?
 Child: a car and a cup!
 (Barney comes on stage and starts to wash the car)
 Elmo: Hey and there is Barney! What is Barney doing?
 Child: Barney/He is washing **the** car.
 *Barney/He is washing **a** car.
- (16) indefinite – non-referential/non-existent **a house**
Situation: picture of Elmo drawing a house (NOT finished)
 Elmo: Hey, who is this (pointing at Elmo)?
 Child: Elmo!
 Elmo: And what is Elmo doing?
 Child: He's drawing **a** house.
 *He's drawing **the** house.

- (17) indefinite – non-referential/non-existent **a car**
Situation: picture of Elmo painting a car (NOT finished)
 Elmo: Hey, who is this (pointing at Elmo)?
 Child: Elmo!
 Elmo: And what is Elmo doing?
 Child: He's painting **a** car.
 *He's painting **the** car.
- (18) indefinite – non-referential/non-existent **a castle**
Situation: Minnie building a tower/something (with lego/building blocks)
 (NOT finished)
 Elmo: Hey, who is this (pointing at Minnie)?
 Child: Minnie!
 Elmo: And what is Minnie doing?
 Child: She's building **a** tower/...
 *She's building **the** tower/...
- (19) indefinite – referential/existent **a house**
Situation: picture of Mickey Mouse who just finished drawing a house
 Elmo: Hey, who is this (pointing at Mickey Mouse)?
 Child: Mickey Mouse!
 Elmo: And what did Mickey Mouse just do?
 Child: He drew **a** house.
 *He drew **the** house.
- (20) indefinite – referential/existent **a car**
Situation: picture of Mickey Mouse who just finished painting a car
 Elmo: Hey, who is this (pointing at Mickey Mouse)?
 Child: Mickey Mouse!
 Elmo: And what did Mickey Mouse just do?
 Child: He painted **a** car.
 *He painted **the** car.
- (21) indefinite – referential/existent **a castle**
Situation: Ernie – just finished building something with legoblocks
 Elmo: Hey, who is this (pointing at Ernie)?
 Child: Ernie!
 Elmo: And what did Ernie just do?
 Child: He built **a**...
 *He built **the**...

- (22) indefinite – non-referential **a tree**
 Big Bird: Oh, I'm so bored, I don't know what to do. Oh, you know what, I'm going to the forest, and I'm gonna DRAW something there.
 Elmo: What do you think Big Bird is gonna do in the forest?
 Child: He's gonna draw **a tree**!
 *He's gonna draw **the** tree!
- (23) indefinite – non-referential **a book**
 Pluto: Oh, I'm so bored, I don't know what to do. Oh, you know what, I'm going to the book store, and I'm gonna BUY something there.
 Elmo: What do you think Pluto is gonna do in the book store?
 Child: He's gonna buy **a book**!
 *He's gonna buy **the** book!
- (24) indefinite – non-referential **a toy/doll etc.**
 Barney: Oh, I'm so bored, I don't know what to do. Oh, you know what, I'm going to the toy store, and I'm gonna BUY something there.
 Elmo: What do you think Barney is gonna do in the toy store?
 Child: He's gonna buy **a . . .**!
 He's gonna buy **the . . .**!
- (25) definite – referential/existent **the ball**
Situation: ball on table
 Elmo: Hey, who is this (pointing at Mickey Mouse)
 Child: Mickey Mouse!
 Elmo: And this (pointing at the ball)
 Child: a ball!
 (Mickey Mouse kicks the ball)
 Elmo: What did Mickey Mouse just do?
 Child: He kicked **the** ball
 *He kicked **a** ball
- (26) definite – referential/existent **the car**
Situation: car on table
 Elmo: Hey, who is this (pointing at Donald Duck)
 Child: Donald Duck!
 Elmo: And this (pointing at the car)
 Child: a car!
 (Donald Duck pushes the car)
 Elmo: What did Donald Duck just do?
 Child: He pushed **the** car
 *He pushed **a** car

- (27) definite – referential/existent **the banana**
Situation: ball on table
 Elmo: Hey, who is this (pointing at Ernie)
 Child: Ernie!
 Elmo: And this (pointing at the banana)
 Child: a banana!
 (Ernie eats the banana)
 Elmo: What did Ernie just do?
 Child: He ate **the** banana
 *He ate **a** banana
- (28) definite DP **the sun**
Situation: picture of Mickey Mouse looking/pointing at the sun
 Elmo: Look, here's a picture. Who's this (pointing at Mickey Mouse)?
 Child: Mickey Mouse!
 Elmo: What's Mickey Mouse doing?
 Child: He's looking/pointing at/to **the** sun.
 *He's looking/pointing at/to **a** sun.
- (29) definite DP **the moon**
Situation: picture of Elmo looking/pointing at the moon
 Elmo: Look, here's a picture. Who's this (pointing at Elmo)?
 Child: Elmo!
 Elmo: What's Elmo doing?
 Child: He's looking/pointing at/to **the** moon.
 *He's looking/pointing at/to **a** moon.
- (30) definite DP **the sea/ocean**
Situation: picture of Ernie swimming/playing in the sea/ocean
 Elmo: Look, here's a picture. Who's this (pointing at Ernie)?
 Child: Ernie!
 Elmo: What's Ernie doing?
 Child: He's swimming/playing in **the** sea.
 *He's swimming/playing in **a** sea.

APPENDIX B: ORDER OF PRESENTATION OF SCENARIOS

For the order of presentation we used 'Randomization 1' for half of the children, and 'Randomization 2' for the other half.

Randomization 1

Session A	Session B	Session C
25	26	27
11	12	10
20	21	19
1	2	3
28	29	30
7	8	9
13	14	15
32	33	31
5	6	4
22	23	24
16	17	18

Randomization 2

Session A	Session B	Session C
28	29	30
7	8	9
20	21	19
11	12	10
32	33	31
16	17	18
5	6	4
13	14	15
25	26	27
1	2	3
22	23	24

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Received 5 September 2000

Revised 17 February 2004

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